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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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09/991,154

11/16/2001

Morten Nissov

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7590

06/28/2005

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EXAMINER

PHAN, HANH

ART UNIT

PAPER NUMBER

2638

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,154

Applicant(s)

NISSOV ET AL.

Examiner

Hanh Phan

Art Unit

2638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13,15-17,19,20 and 22-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-13,15-17,19,20 and 22-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 01/03/2005.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3-7, 9, 11-13, 16, 17, 20, 24-29 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Way et al (US Patent No. 6,366,728).

Regarding claims 1 and 31, referring to Figures 1, 2 and 7, Way discloses a method of compensating for chromatic dispersion in an optical signal transmitted on a long-haul terrestrial optical communication system including a plurality of spans (Fig. 1), the method comprising:

allowing chromatic dispersion to accumulate over a plurality of spans in a transmission path (i.e., transmission path 12, Fig. 1), the transmission path (12, Fig. 1) including a plurality of high loss spans (i.e., standard single mode fiber SSMF 202, Fig. 7); and

identifying a plurality of non-periodically spaced low loss spans (i.e., nonzero dispersion shift fiber NZDSF 204, Fig. 7) in the transmission path, each of the low loss spans having an associated loss lower than a loss associated with each of the high loss spans in the transmission path;

compensating for dispersion accumulated on the plurality of spans using a plurality of separate dispersion compensating fibers (i.e., dispersion compensating fiber DCF 206, Fig. 7), each of the dispersion compensating fibers (i.e., DCF 206, Fig. 7) being directly coupled to an associated one of the low loss spans (i.e., NZDSF 204, Fig. 7)(see col. 8, lines 30-64 and col. 15, lines 12-23).

Regarding claim 3, Way further discloses at least one of the dispersion compensating fibers (i.e., DCF 32, Fig. 2) is disposed between stages of a multi-stage rare earth doped amplifier.

Regarding claim 4, Way further discloses the rare earth doped amplifier (34, Fig. 2) is an erbium doped amplifier (Fig. 2).

Regarding claim 5, Way further discloses at least one of the dispersion compensating fibers (i.e., DCF 32, Figs. 1 and 2) is disposed in an amplifier following a relatively low loss one of the spans.

Regarding claim 6, Way further discloses at least one of the dispersion compensating fibers (i.e., DCF 32, Fig. 2) is disposed between a Raman portion (30, Fig. 2) and an EDFA portion (34, Fig. 2) of a Raman/EDFA amplifier.

Regarding claim 7, Way further discloses configuring a gain of the Raman portion (30, Fig. 2) to achieve a desired noise figure level for the Raman/EDFA amplifier (col. 10, lines 18-67 and col. 11, lines 1-6).

Regarding claim 9, way further discloses configuring a gain of the EDFA portion to achieve a predetermined total gain for the Raman/EDFA amplifier (Fig. 2, col. 10, lines 18-67 and col. 11, lines 1-6).

Regarding claim 11, Way further discloses the EDFA (34, Fig. 2) portion of the Raman/EDFA amplifier is a single-stage EDFA.

Regarding claims 12, 16 and 25, Way further discloses the signal is transmitted a distance of greater than 600 kilometers (Fig. 1).

Regarding claims 13, 17, 20, 27 and 28, referring to Figures 1, 2 and 7, Way discloses an optical communication system comprising:

a transmitter (14, Fig. 1) configured to transmit an optical signal over an optical information path (12, Fig. 1) to a receiver (16, Fig. 1), the optical information path (12, Fig. 1) comprising:

at least one Raman/EDFA amplifier (30, 34, Fig. 2) having a Raman portion (30, Fig. 2) and an EDFA (34, Fig. 2) portion and at least one dispersion compensating fiber (32, Fig. 2) disposed between the Raman portion and the EDFA portion, wherein the EDFA portion is a single stage EDFA (see col. 8, lines 30-64 and col. 15, lines 12-23).

Regarding claim 24, Way further discloses the EDFA portion (34, Fig. 2) is a single-stage EDFA.

Regarding claims 26 and 29, way further discloses the dispersion compensating fiber (32, Fig. 2) is disposed within a Raman portion of a Raman/EDFA amplifier.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8, 10, 15, 19, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Way et al (US Patent No. 6,366,728) in view of Friedrich (US Patent No. 6,466,362).

Regarding claims 8, 15, 19 and 22, Way differs from claims 8, 15, 19 and 22 in that he does not specifically teach the gain of the Raman portion is about 10-15dB. However, Friedrich in US Patent No. 6,466,362 teaches the gain of the Raman portion is about 10-15dB (col. 7, lines 5-7). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the gain of the Raman portion is about 10-15dB as taught by Friedrich in the system of way. One of ordinary skill in the art would have been motivated to do this since Friedrich suggests in column 7, lines 5-7 that using such the gain of the Raman portion is about 10-15dB have advantage of allowing minimizing the noise figure for a plurality of different span losses.

Regarding claims 10 and 23, the combination of Way and Friedrich teaches the gain of the EDFA portion is about 5-15 dB (col. 7, lines 5-7 of Friedrich).

6. Claims 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Way et al (US Patent No. 6,366,728).

Regarding claims 30 and 32, it would have been obvious to obtain the loss associated with the high loss spans is between about 15-25dB, and the loss associated with low loss spans is between about 5-15dB in order to provide overall improved performance such as an improved data rate and bandwidth, across a range of optical signal wavelengths while still maintaining acceptable or minimal levels of chromatic dispersion.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 3-13, 15-17, 19, 20 and 22-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye, can be reached on (571)272-3078. The fax phone

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number for the organization where this application or proceeding is assigned is
(703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.


HANH PHAN
PRIMARY EXAMINER